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3RD GENERATION PARTNERSHIP PROJECT 2 "3GPP2"

# Signaling Test Specification for EUTRAN-cdma2000 Connectivity and Interworking

Revision History

| **Revision** | **Description Of Changes** | **Date** |
|---|---|---|
| Rev 0 v1.0 | Initial Publication | December 2009 |
| Rev 0 v2.0 | Point Release for bug fixes | July 2011 |

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# FOREWORD

**(This foreword is not part of this specification)**

This specification was prepared by Technical Specification Group C of the Third Generation Partnership Project 2 (3GPP2). This specification is the second version of the document and provides the signaling conformance and interoperability requirements for C.S0087-0 (Interworking of cdma2000 1X High Rate Packet Data and Long Term Evolution Systems) and X.S0057-0 (E-UTRAN - eHRPD Connectivity and Interworking: Core Network Aspects).

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## REFERENCES

This section provides references to other specifications and standards that are necessary to implement this document.

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.


1. **3GPP2:** C.S0038-B v1.0, *Signaling Conformance Specification for High Rate Packet Data Air Interface.*
2. **3GPP2:** C.S0087-0 v2.0, *E-UTRAN – cdma2000 Connectivity and Interworking: Air Interface Specification.*
3. **3GPP2:** X.S0057-0 v1.0, *E-UTRAN - eHRPD Connectivity and Interworking: Core Network Aspects.*
4. **3GPP2:** C.S0015-B v2.0, *Short Message Service (SMS) for Wideband Spread Spectrum Systems.*
5. **3GPP2:** C.S0081-0 v1.0, *Signaling Conformance Specification for cdma2000 High Rate Packet Data Supplemental Services.*
6. **3GPP2:** C.S0024-B v3.0, *cdma2000 High Rate Packet Data Air Interface Specification.*
7. **3GPP2:** C.S0063-0 v2.0, *cdma2000 High Rate Packet Data Supplemental Services.*
8. **3GPP2:** C.S0005-D v2.0, *Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems.*
9. **3GPP:** *TS 36.331 Radio Resource Control; Protocol Specification (Release 8)*

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# 1 Introduction

## 1.1 Scope

This specification defines signaling conformance and interoperability tests for CDMA infrastructure and mobile stations using eHRPD and interworking of eHRPD with HRPD, cdma2000® 1x and E-UTRAN systems.

## 1.2 Test Setup

The typical test set-up required for the test is shown below.

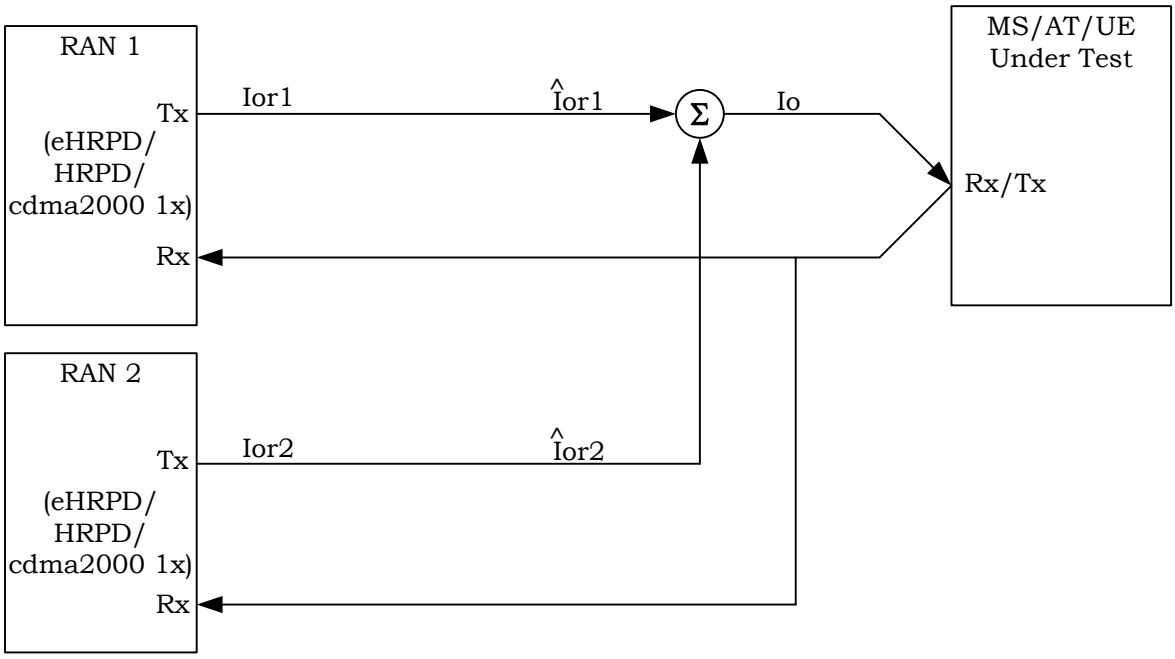


**Figure 1 – Test Setup with two Radio Access Networks**

*cdma2000® is the trademark for the technical nomenclature for certain specifications and standards of the Organizational Partners (OPs) of 3GPP2. Geographically (and as of the date of publication), cdma2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA) in the United States.*

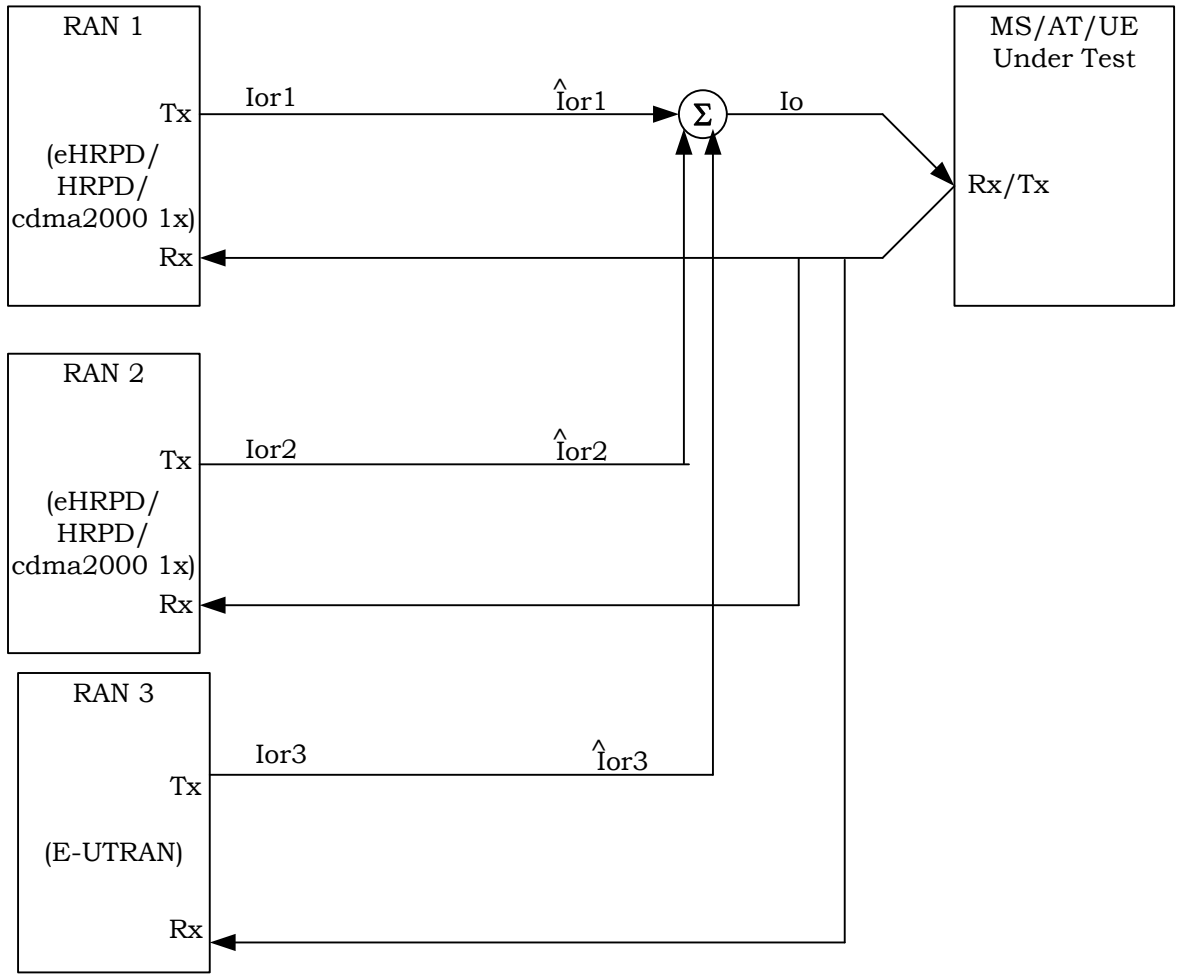


**Figure 2 – Test Setup for mobility between E-UTRAN and eHRPD**

# 2 Conformance and Interoperability Tests

## 2.1 Session Negotiation Tests

### 2.1.1 Introduction

Tests included in this section verify that the Access Terminal (AT) advertises its eHRPD capability to the eHRPD network during session negotiation and accepts the protocols and parameters to support eHRPD session.

### 2.1.2 Session Negotiation with eHRPD Access Network

#### 2.1.2.1 Definition

This test verifies that the AT advertises eHRPD capability to the network during session negotiation and that this capability is successfully negotiated between the access terminal and the eHRPD network.

#### 2.1.2.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

| | |
|---|---|
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

#### 2.1.2.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. If the AT has an open session with the RAN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Ensure that the AT has an eHRPD IMSI and credentials (authentication keys) provisioned.

d. Cause the AT to negotiate a new session with the RAN.

e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to the service network for ATSupportedApplicationSubtype attribute in the *ConfigurationRequest* message for SCP configuration.

f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the *ConfigurationRequest* message.

g. Verify that the AT does not propose Alternate EMPA bound to service network (0xFFFE) in the *ConfigurationRequest* message for the stream protocol.

h. Verify that the AT proposes DPA (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to the service network in the *ConfigurationRequest* message for the stream protocol.

i. Ensure that the RAN accepts the EMPA bound to service network (0x0009) in the *ConfigurationResponse* message for the stream protocol.

j. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the ATSupportedFlowProtocolParametersPP attribute of EMPA.

k. Ensure that the RAN proposes a value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.

l. Verify that the AT accepts a value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFF as proposed by the RAN.

m. Verify that the AT is able to successfully complete the session negotiation.

n. Cause the AT to start a packet data call and establish a connection with the RAN.

o. Verify that the AT is able to successfully send and receive data using ReservationLabel 0xFF.

#### 2.1.2.4 Minimum Standard

The AT shall comply with steps e, g, h, j, l, m and o.

### 2.1.3 Session Negotiation with HRPD Access Network

#### 2.1.3.1 Definition

This test verifies that the AT advertises eHRPD capability to the RAN during session negotiation and that session negotiation proceeds when this capability is not negotiated by the HRPD RAN.

#### 2.1.3.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

2.1.3.3 Test Procedure

a. Ensure that HRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. If the AT has an open session with the RAN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Ensure that the AT has an eHRPD IMSI and credentials (authentication keys) provisioned.

d. Cause the AT to negotiate a new session with the RAN.

e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to the service network for the ATSupportedApplicationSubtype attribute in the *ConfigurationRequest* message for SCP configuration.

f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the *ConfigurationRequest* message.

g. Verify that the AT does not propose Alternate EMPA bound to service network (0xFFFE) in the *ConfigurationRequest* message for the stream protocol.

h. Ensure that the RAN accepts any application subtype other than Alternate EMPA bound to service network (0xFFFE) in the *ConfigurationResponse* message for the stream protocol. Note, the default behavior of the RAN will always follow this step as the AT should not propose Alternate EMPA in step g.

i. Ensure that the RAN does not propose a value of 0x07 or 0x08 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the Link Flow bound to ReservationLabel 0xFF.

j. Verify that the AT is able to successfully complete the session negotiation.

k. Cause the AT to start a packet data call and establish a connection with the RAN.

l. Verify that the AT is able to successfully send and receive data using ReservationLabel 0xFF.

2.1.3.4 Minimum Standard

The access terminal shall comply with steps e, g, j and l.

### 2.1.4 ProtocolID 0x08 Negotiation during Session Establishment with eHRPD Access Network

#### 2.1.4.1 Definition

This test verifies that if the AT supports ProtocolID value of 0x08, then the AT advertises this capability during session establishment. Further, it also verifies that if the AN negotiates ProtocolID value of 0x08 for the FlowNNFlowProtocolParametersRev attribute of the link flow bound to ReservationLabel 0xFE, then the AT accepts this value and can send data for ReservationLabel 0xFE using this link. The test also verifies that data for other ReservationLabels other than 0xFF can be sent using the same link flow to which ReservationLabel 0xFE is bound. This test is not mandatory for the ATs.

#### 2.1.4.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

| | |
|---|---|
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

#### 2.1.4.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. If the AT has an open session with the RAN:

   1. Instruct the RAN to send a *SessionClose* message to the AT.

   2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

d. Cause the AT to negotiate a new session with the RAN.

e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to the service network for ATSupportedApplicationSubtype attribute in the *ConfigurationRequest* message for SCP configuration.

f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the *ConfigurationRequest* message.

g. Verify that the AT does not propose Alternate EMPA bound to service network (0xFFFE) in the *ConfigurationRequest* message for the stream protocol.

h. Verify that the AT proposes DPA (0x0002), MPA (0x0005), EMPA (0x0009), and optionally MMPA (0x000D) bound to the service network in the *ConfigurationRequest* message for the stream protocol.

i. Ensure that the RAN accepts the EMPA bound to service network (0x0009) in the *ConfigurationResponse* message for the stream protocol.

j. Verify that the AT includes a value of 0x07 and 0x08 for the ProtocolSupported field in the ATSupportedFlowProtocolParametersPP attribute of EMPA.

k. Ensure that the RAN proposes the a value of 0x08 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFE. Ensure that the link flow is active.

l. Instruct the AN to map ReservationLabel other than 0xFF to the same link flow to which ReservationLabel 0xFE is mapped.

m. Verify that the AT accepts the value of 0x08 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFE as proposed by the RAN.

n. Verify that the AT is able to successfully complete the session negotiation.

o. Cause the AT to start a packet data call and establish a connection with the RAN.

p. Verify that the AT is able to successfully send and receive data for ReservationLabel 0xFE.

#### 2.1.4.4 Minimum Standard

The AT shall comply with steps e, g, h, j, m, n, and p.

### 2.1.5 MMPA based eHRPD Personality Negotiation with eHRPD Access Network

#### 2.1.5.1 Definition

This test is only applicable to ATs that support MMPA based eHRPD operation. The test verifies that the AT accepts personalities based on MMPA packet application.

#### 2.1.5.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

2.1.5.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. If the AT has an open session with the RAN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

d. Cause the AT to negotiate a new session with the RAN.

e. Verify that the AT includes Application Subtypes Alternate EMPA (0xFFFE), Alternate MMPA (0xFFFC), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and MMPA (0x000D) bound to the service network for ATSupportedApplicationSubtype attribute in the *ConfigurationRequest* message for SCP configuration.

f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the *ConfigurationRequest* message.

g. Verify that the AT includes MMPA bound to the service network (0x000D) in the proposed application subtypes in the *ConfigurationRequest* message for the stream protocol and excludes Alternate MMPA bound to service network (0xFFFC) in the proposed application subtypes in the *ConfigurationRequest* message for the stream protocol.

h. Instruct the RAN to accept MMPA bound to service network (0x000D) in the *ConfigurationResponse* message for the stream protocol.

i. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the ATSupportedFlowProtocolParametersPP attribute of MMPA.

j. Ensure that the RAN proposes the a value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the MMPA Link Flow bound to ReservationLabel 0xFF.

k. Verify that the AT accepts the value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the MMPA Link Flow bound to ReservationLabel 0xFF as proposed by the RAN.

l. Verify that the AT is able to successfully complete the session negotiation.

m. Cause the AT to start a packet data call and establish a connection with the RAN.

n. Verify that the AT is able to successfully send and receive data using ReservationLabel 0xFF.

#### 2.1.5.4 Minimum Standard

The AT shall comply with steps e, g, i, k, and n.

### 2.1.6 Switching between MMPA and EMPA based eHRPD Personality

#### 2.1.6.1 Definition

This test is only applicable to ATs that support MMPA based eHRPD operation. The test verifies that the AT is able to switch between EMPA and MMPA based eHRPD personality.

#### 2.1.6.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

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|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

| | |
|---|---|
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

#### 2.1.6.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. If the AT has an open session with the RAN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the AN.

c. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

d. Cause the AT to negotiate a new session with the RAN.

e. Ensure that the AT includes Application Subtypes Alternate EMPA (0xFFFE), Alternate MMPA (0xFFFC), DPA (0x0002), MPA (0x0005), EMPA (0x0009), and MMPA (0x000D) bound to the service network for ATSupportedApplicationSubtype attribute in the *ConfigurationRequest* message for SCP configuration.

f. Ensure that the RAN sends a *ConfigurationResponse* message in response to the *ConfigurationRequest* message.

g. Verify that the AT includes EMPA bound to the service network (0x0009) in the proposed application subtypes in the *ConfigurationRequest* message for the stream protocol and excludes Alternate EMPA bound to service network (0xFFFE) in the proposed application subtypes in the *ConfigurationReques*t message for the stream protocol.

h. Instruct the RAN to accept EMPA bound to service network (0x0009) in the *ConfigurationResponse* message for the stream protocol.

o. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the ATSupportedFlowProtocolParametersPP attribute of EMPA.

p. Ensure that the RAN proposes the a value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.

i. Verify that the AT sends a *ConfigurationResponse* message and accepts the value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFF as proposed by the RAN.

j. After the AT responds to the RAN initiated *ConfigurationRequest* messages, instruct the AN to send a *SoftConfiguratonComplete* message with Continue field set to '1'.

k. Verify that the AT includes MMPA bound to the service network (0x000D) in the proposed application subtypes in the *ConfigurationRequest* message for the stream protocol and excludes Alternate MMPA bound to service network (0xFFFC) in the proposed application subtypes in the *ConfigurationRequest* message for the stream protocol.

l. Instruct the RAN to accept MMPA bound to service network (0x000D) in the *ConfigurationResponse* message for the stream protocol.

m. Verify that the AT includes a value of 0x07 for the ProtocolSupported field in the ATSupportedFlowProtocolParametersPP attribute of MMPA.

n. Instruct the RAN to accept MMPA bound to service network (0x000D) in the *ConfigurationResponse* message for the stream protocol for this personality.

o. Verify that the AT sends a *ConfigurationResponse* message and accepts the value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the MMPA Link Flow bound to ReservationLabel 0xFF as proposed by the RAN.

p. Ensure that the RAN sends a *SoftConfiguratonComplete* message with Continue field set to '0' and that EMPA based personality is in use.

q. Cause the AT to start a packet data call and establish a connection with the RAN.

r. Verify that the AT is able to send and receive data using ReservationLabel 0xFF.

s. Instruct the RAN to switch the personality of the AT from EMPA to MMPA based personality.

t. Repeat steps q-r.

#### 2.1.6.4 Minimum Standard

The AT shall comply with steps g, o, i, k, m, o, and r.

## 2.2 Session Configuration Tests for Dormant Mobility between eHRPD and HRPD

### 2.2.1 Introduction

Tests included in this section verify that when the AT moves across eHRPD and HRPD RAN boundary, the AT and the RAN negotiate attributes needed for operation in target eHRPD or HRPD RAN. Note, IP continuity will not be maintained during mobility between eHRPD and HRPD networks.

### 2.2.2 Dormant eHRPD to HRPD mobility with eHRPD to HRPD personality switch occurring in response to ConnectionRequest

#### 2.2.2.1 Definition

This test verifies that the AT is able to switch between eHRPD and HRPD capable personalities. Specifically, it is verified that the AT switches to the HRPD personality when the HRPD network switches the personality upon receiving a *ConnectionRequest* message from the AT. The PPP renegotiation and the QoS related changes for this scenario will be tested separately.

#### 2.2.2.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

| | |
|---|---|
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

[1]

| | |
|---|---|
| Section 6.3.2.3 | Multiple Personality Negotiation |

#### 2.2.2.3 Test Procedure

a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to the AT and HRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets.

b. If the AT has an open session with the RAN:

   1. Instruct the RAN to send a *SessionClose* message to the AT.
   2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Cause the AT to negotiate a new session with the AN.

d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation and that the AT is operating with the eHRPD personality. Note, the RAN should use separate packet applications for the two personalities.

e. Ensure that the AT is dormant on the eHRPD network.

f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on the HRPD network.

g. If the HRPD and eHRPD RANs are in different subnets:

    1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a *UATIAssignment* message.

    2. Ensure that the AT sends a *UATIComplete* message to the RAN.

h. Cause the AT to start a packet data call and send a *ConnectionRequest* message to the HRPD RAN.

i. Instruct the HRPD network to send an *AttributeUpdateRequest* message changing the SessionConfigurationToken with four MSB to the HRPD personality along with a *TrafficChannelAssignment* message. Note, the RAN should include the *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in the same security layer packet.

j. Verify that the AT starts using the HRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant bits of SessionConfigurationToken for the HRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF.

#### 2.2.2.4 Minimum Standard

The AT shall comply with step j.

### 2.2.3 Dormant eHRPD to HRPD mobility with eHRPD to HRPD personality switch initiated in response to access

#### 2.2.3.1 Definition

This test verifies that the AT is able to switch between eHRPD and HRPD capable personalities during eHRPD to HRPD mobility. Specifically, it is verified that the AT switches to the HRPD personality when the HRPD network switches the personality along with the *UATIAssignment* message or in response to any other message sent by the AT on the access channel. The PPP renegotiation and the QoS related changes for this scenario will be tested separately.

#### 2.2.3.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

Section 6.2.6.1.2 Processing the SessionClose Message

[7]

Section 2.9.2.5 ATSupportedFlowProtocolParametersPP attribute

[1]

Section 6.3.2.3 Multiple Personality Negotiation

2.2.3.3 Test Procedure

a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to the AT and HRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets. Note, this configuration is useful in step g where it is required that the AT send a message on the access channel.

b. If the AT has an open session with the AN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Cause the AT to negotiate a new session with the RAN.

d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation and that the AT is operating with the eHRPD personality. Note, the RAN should use separate packet applications for the two personalities.

e. Ensure that the AT is dormant on the eHRPD network.

f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on the HRPD network.

g. Cause the AT to send a message on the access channel. For example, the AT may send a *UATIRequest* message.

h. Instruct the HRPD network to send an *AttributeUpdateRequest* changing the SessionConfigurationToken with four MSB to the HRPD personality.

i. Cause the AT to start a packet data call and establish a connection with the HRPD RAN.

j. Verify that the AT starts using the HRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant bits of the SessionConfigurationToken for the HRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF.

2.2.3.4 Minimum Standard

The AT shall comply with step j.

### 2.2.4 Dormant HRPD to eHRPD mobility with HRPD to eHRPD personality switch occurring in response to ConnectionRequest

#### 2.2.4.1 Definition

This test verifies that the AT is able to switch between HRPD and eHRPD capable personalities. Specifically, it is verified that the AT switches to the eHRPD personality when the eHRPD network switches the personality upon receiving a *ConnectionRequest* message from the AT after the *UATIAssignment* has been made. The test assumes that the RAN is able to store the eHRPD capability of the AT and that this capability is part of session transfer during mobility across eHRPD and HRPD. The PPP renegotiation and the QoS related changes for this scenario will be tested separately.

Note, in the test procedure below, eHRPD and HRPD personalities are first negotiated in an eHRPD network in steps a-e. This is followed by an eHRPD to HRPD dormant mobility in steps f-k. These steps are necessary as it is assumed that the HRPD network may not be capable of negotiating an eHRPD personality.

#### 2.2.4.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

| | |
|---|---|
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

[1]

| | |
|---|---|
| Section 6.3.2.3 | Multiple Personality Negotiation |

#### 2.2.4.3 Test Procedure

a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to the AT and HRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets.

b. If the AT has an open session with the RAN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Cause the AT to negotiate a new session with the AN.

d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation and that the AT is operating with the eHRPD personality. Note, the RAN should use separate packet applications for the two personalities.

e. Ensure that the AT is dormant on the eHRPD network.

f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on the HRPD network.

g. If the HRPD and eHRPD RANs are in different subnets:

    1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a *UATIAssignment* message.

    2. Ensure that the AT sends a *UATIComplete* message to the RAN.

h. Cause the AT to start a packet data call and send a *ConnectionRequest* message to the HRPD RAN.

i. Instruct the HRPD network to send an *AttributeUpdateRequest* message changing the SessionConfigurationToken with four MSB to the HRPD personality along with a *TrafficChannelAssignment* message. Note, the AN should include the *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in the same security layer packet.

j. Ensure that the AT starts using the HRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant bits of SessionConfigurationToken for the HRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF.

k. Allow the AT to become dormant on the HRPD network.

l. Cause the pilot strength of the eHRPD network to increase such that the AT is idle on the eHRPD network.

m. If the HRPD and eHRPD RANs are in different subnets:

    1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a *UATIAssignment* message.

    2. Ensure that the AT sends a *UATIComplete* message to the RAN.

n. Cause the AT to send a *ConnectionRequest* message to the eHRPD RAN.

o. Instruct the eHRPD network to send an *AttributeUpdateRequest* message changing the SessionConfigurationToken with four MSB to the eHRPD personality along with a *TrafficChannelAssignment* message. Note, the RAN should include the *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in the same security layer packet.

p. Ensure that the AT performs EAP AKA' Authentication as specified in section 2.6.2 and obtains an IP address as specified in section 2.7.2 or 2.7.3.

q. Verify that the AT starts using the eHRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant bits of SessionConfigurationToken for the eHRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF that is bound to the EMPA Link Flow with the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes negotiated to a value 0x07.

#### 2.2.4.4 Minimum Standard

The AT shall comply with step q.

### 2.2.5 Dormant HRPD to eHRPD mobility with HRPD to eHRPD personality switch initiated in response to access

#### 2.2.5.1 Definition

This test verifies that the AT is able to switch between HRPD and eHRPD capable personalities. Specifically, it is verified that the AT switches to the eHRPD personality when the eHRPD network switches the personality along with the *UATIAssignment* message or in response to any other message sent by the AT on the access channel. The test assumes that the RAN is able to store the eHRPD capability of the AT and that this capability is part of session transfer during mobility across eHRPD and HRPD. The PPP renegotiation and the QoS related changes for this scenario will be tested separately.

Note, in the test procedure below, eHRPD and HRPD personalities are first negotiated in an eHRPD network in steps a-e. This is followed by an eHRPD to HRPD dormant mobility in steps f-k. These steps are necessary as it is assumed that the HRPD network may not be capable of negotiating an eHRPD personality.

#### 2.2.5.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[7]

| | |
|---|---|
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

[1]

| | |
|---|---|
| Section 6.3.2.3 | Multiple Personality Negotiation |

#### 2.2.5.3 Test Procedure

a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to the AT and HRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets.

b. If the AT has an open session with the RAN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Cause the AT to negotiate a new session with the RAN.

d. Ensure that the RAN negotiates two personalities for HRPD and eHRPD operation and that the AT is operating with the eHRPD personality. Note, the RAN should use separate packet applications for the two personalities.

e. Ensure that the AT is dormant on the eHRPD network.

f. Cause the pilot strength of the HRPD network to increase such that the AT is idle on the HRPD network.

g. If the HRPD and eHRPD RANs are in different subnets:

    1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a *UATIAssignment* message.

    2. Ensure that the AT sends a *UATIComplete* message to the AN.

h. Cause the AT to start a packet data call and send a *ConnectionRequest* message to the HRPD RAN.

i. Instruct the HRPD network to send an *AttributeUpdateRequest* message changing the SessionConfigurationToken with four MSB to the HRPD personality along with a *TrafficChannelAssignment* message. Note, the RAN should include the *AttributeUpdateRequest* message before the *TrafficChannelAssignment* message in the same security layer packet.

j. Ensure that the AT starts using the HRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant bits of SessionConfigurationToken for the HRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF.

k. Allow the AT to become dormant on the HRPD network.

l. Cause the pilot strength of the eHRPD network to increase such that the AT is idle on the eHRPD network.

m. Cause the AT to send a message on the access channel. For example, the AT may send a *UATIRequest* message.

n. Instruct the eHRPD network to send an *AttributeUpdateRequest* changing the SessionConfigurationToken with four MSB to the eHRPD personality.

o. Cause the AT to start a packet data call and to open a connection with the RAN and send and receive data.

p. Ensure that the AT performs EAP AKA' Authentication as specified in section 2.6.2 and obtains an IP address as specified in section 2.7.2 or 2.7.3.

q. Verify that the AT starts using the eHRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant bits of SessionConfigurationToken for the eHRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF that is bound to a Link Flow with FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes negotiated to a value of 0x07.

#### 2.2.5.4 Minimum Standard

The AT shall comply with step q.

### 2.2.6 eHRPD to HRPD Dormant mobility with SCP renegotiation of ProtocolID initiated at Access

#### 2.2.6.1 Definition

This test verifies the AT's support for negotiating ProtocolID through SCP based negotiation for dormant mobility from eHRPD to HRPD. The test assumes that the session transfer can occur through the A13 link between the HRPD and eHRPD RANs.

#### 2.2.6.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |
| Section 4.4.4.4.16 | AttributeUpdateRequest Message |

[7]

| | |
|---|---|
| Section 2.5.4.1 | Procedures |
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

[1]

| | |
|---|---|
| Section 6.3.2.3 | Multiple Personality Negotiation |

#### 2.2.6.3 Test Procedure

a. Connect the AT as shown in Figure 1. Ensure that the eHRPD system is available to the AT and HRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets.

b. If the AT has an open session with the AN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Cause the AT to negotiate a new session with the RAN.

d. Ensure that the RAN negotiates and AT accepts a value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes for the EMPA Link Flow bound to ReservationLabel 0xFF.

e. Ensure that the AT can send and receive data using ReservationLabel 0xFF.

f. Ensure that the AT is dormant on the eHRPD network.

g. Cause the pilot strength of the HRPD network to increase such that the AT is idle on the HRPD network.

h. If the HRPD and eHRPD ANs are in different subnets:

    1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a *UATIAssignment* message.

    2. Ensure that the AT sends a *UATIComplete* message to the RAN.

i. If the HRPD and eHRPD RANs are in different subnets cause the AT to send a *ConnectionRequest* message to the HRPD RAN.

j. Instruct the RAN to send a *ConfigurationStart* message to the AT.

k. Verify that the AT sends a *ConfigurationComplete or ConfigurationRequest* message to the RAN.

l. If the AT sends a *ConfigurationRequest* message to the RAN, ensure that the RAN sends a *ConfigurationResponse* message and accepts the values proposed in the *ConfigurationRequest* message.

m. During the AN initiated session configuration phase ensure that the RAN does not propose a value of 0x07 or 0x08 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the Link Flow bound to ReservationLabel 0xFF.

n. Verify that the AT accepts the values proposed by the RAN and sends a *ConfigurationResponse* message in response to the *ConfigurationRequest* message sent by the RAN.

o. Instruct the RAN to send a *ConfigurationComplete* message to the AT. If the RAN does not negotiate additional personality, ensure that the RAN sends the *ConfigurationComplete* message with PersonalityIndexStore field set to a value that overrides the existing personality. If the RAN negotiated multiple personalities, ensure that the RAN sends the *ConfigurationComplete* message with PersonalityIndexStore field set to the HRPD personality. Note, the RAN should use Multi Flow Packet Application in the HRPD network.

p. Verify that the AT sends a *ConnectionClose* message to the RAN.

q. Cause the AT to establish a packet data call by starting any application.

r. Verify that the AT can send and receive data ReservationLabel 0xFF that is bound to an EMPA Link Flow with ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes negotiated to a value other than 0x07 and 0x08.

s. If the RAN negotiated multiple personalities during session reconfiguration, verify that the AT starts using the HRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant

bits of SessionConfigurationToken for the HRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF.

t. Repeat the test with RAN negotiating a separate personality and renegotiating the same personality during session renegotiation by setting the HRPD personality using the PersonalityIndexStore field in the *ConfigurationComplete* message in step o.

#### 2.2.6.4 Minimum Standard

The AT shall comply with steps k, n, p, and s.

### 2.2.7 HRPD to eHRPD Dormant mobility with SCP Renegotiation of ProtocolID initiated at Access

#### 2.2.7.1 Definition

This test verifies the AT's support for negotiating ProtocolID through SCP based negotiation for dormant mobility from HRPD to eHRPD. The test assumes that the session transfer can occur through the A13 link between the HRPD and eHRPD RANs.

#### 2.2.7.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |
| Section 4.4.4.4.16 | AttributeUpdateRequest Message |

[7]

| | |
|---|---|
| Section 2.5.4.1 | Procedures |
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

[1]

| | |
|---|---|
| Section 6.3.2.3 | Multiple Personality Negotiation |

#### 2.2.7.3 Test Procedure

a. Connect the AT as shown in Figure 1. Ensure that the HRPD system is available to the AT and eHRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets.

b. If the AT has an open session with the AN:

    1. Instruct the RAN to send a *SessionClose* message to the AT.

    2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Cause the AT to negotiate a new session with the RAN.

d. Ensure that the AN does not negotiate a value of 0x07 or 0x08 for of the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link flow that is bound to ReservationLabel 0xFF.

e. Ensure that the AT can send and receive data using ReservationLabel 0xFF.

f. Ensure that the AT is dormant on the HRPD network.

g. Cause the pilot strength of the eHRPD sector to increase such that the AT is idle on the eHRPD network.

h. If the HRPD and eHRPD RANs are in different subnets:

    1. Ensure that the AT sends a *UATIRequest* message and the RAN sends a *UATIAssignment* message.

    2. Ensure that the AT sends a *UATIComplete* message to the RAN.

i. If the HRPD and eHRPD RANs are in different subnets cause the AT to send a *ConnectionRequest* message to the HRPD RAN.

j. Instruct the RAN to send a *ConfigurationStart* message to the AT.

k. Verify that the AT sends a *ConfigurationComplete or ConfigurationRequest* message to the RAN.

l. If the AT sends a *ConfigurationRequest* message to the RAN, ensure that the RAN sends a *ConfigurationResponse* message and accepts the values proposed in the *ConfigurationRequest* message.

m. During the RAN initiated session configuration phase ensure that the RAN proposes the a value of 0x07 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.

n. Verify that the AT accepts the values proposed by the RAN and sends a *ConfigurationResponse* message in response to the *ConfigurationRequest* message sent by the RAN.

o. Instruct the RAN to send a *ConfigurationComplete* message to the AT. If the RAN does not negotiate additional personality, ensure that the RAN sends the *ConfigurationComplete* message with PersonalityIndexStore field set to a value that overrides the existing personality. If the RAN negotiated multiple personalities, ensure that the RAN sends the *ConfigurationComplete* message with PersonalityIndexStore field set to the eHRPD personality.

p. Verify that the AT sends a *ConnectionClose* message to the RAN.

q. Cause the AT to establish a packet data call by starting any application.

r. If the eHRPD based personality is in use, ensure that the AT performs EAP AKA' Authentication as specified in section 2.6.2 and obtains an IP address as specified in section 2.7.2 or 2.7.3.

s. Verify that the AT can send and receive data ReservationLabel 0xFF that is bound to an EMPA Link Flow with ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes negotiated to a value of 0x07.

t. If the RAN negotiated multiple personalities during session reconfiguration, verify that the AT starts using the eHRPD personality, i.e. in the MAC layer header the AT uses a SessionConfigurationToken with four MSB equal to the four most significant bits of the SessionConfigurationToken for the eHRPD personality, and that the AT can send and receive data using ReservationLabel 0xFF.

u. Repeat the test with RAN negotiating a separate personality and renegotiating the same personality during session renegotiation by setting the eHRPD personality using the PersonalityIndexStore field in the *ConfigurationComplete* message in step o.

#### 2.2.7.4 Minimum Standard

The AT shall comply with steps k, n, p, s, and t.

### 2.2.8 Session Renegotiation when Session Transfer is Unsuccessful

#### 2.2.8.1 Definition

This test verifies the AT's support for negotiating a new session when session transfer fails.

#### 2.2.8.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |
| Section 4.4.4.4.16 | AttributeUpdateRequest Message |

[7]

| | |
|---|---|
| Section 2.5.4.1 | Procedures |
| Section 2.9.2.5 | ATSupportedFlowProtocolParametersPP attribute |

[1]

| | |
|---|---|
| Section 6.3.2.3 | Multiple Personality Negotiation |

#### 2.2.8.3 Test Procedure

a. Connect the AT and the RAN as shown in Figure 1. Ensure that HRPD system is available to the AT and eHRPD system is unavailable to the AT. It is recommended that HRPD and eHRPD RANs are configured to be in different subnets.

b. If the AT has an open session with the RAN:

1. Instruct the RAN to send a *SessionClose* message to the AT.
2. Ensure that the AT sends a *SessionClose* message to the RAN.

c. Cause the AT to negotiate a new session with the RAN.

d. Ensure that the AN does not negotiate a value of 0x07 or 0x08 for of the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link flow that is bound to ReservationLabel 0xFF.

e. Ensure that the AT can send and receive data using ReservationLabel 0xFF.

f. Ensure that the AT is dormant on the HRPD network.

g. Cause the pilot strength of the eHRPD sector to increase such that the AT is idle on the eHRPD network.

h. If the HRPD and eHRPD RANs are in different subnets, ensure that the AT sends a *UATIRequest* message.

i. If the HRPD and eHRPD ANs are in different subnets cause the AT to send a *ConnectionRequest* message to the eHRPD RAN.

j. Instruct the RAN to send a *SessionClose* message to the AT.

k. Verify that the AT sends a *SessionClose* message to the RAN.

l. Verify the AT sends a *UATIRequest* message to RAN.

m. Ensure that RAN sends a *UATIAssignment* message to the AT.

n. Verify the AT sends a *UATIComplete* message.

o. Verify that the AT negotiates a new session with the RAN.

p. Verify the AT completes session negotiation as specified in 2.1.2.

q. Cause the pilot strength of the HRPD sector to increase such that the AT is idle on the HRPD network.

r. If the HRPD and eHRPD RANs are in different subnets, ensure that the AT sends a *UATIRequest* message.

s. If the HRPD and eHRPD RANs are in different subnets cause the AT to send a *ConnectionRequest* message to the HRPD RAN.

t. Repeat steps j-o.

u. Verify the AT completes session negotiation as specified in 2.1.3.

v. Start a packet data application.

w. Verify that the AT can send and receive data.

#### 2.2.8.4 Minimum Standard

The AT shall comply with steps k, l, n, o, p, u and w.

# 2.3 cdma2000 1x and eHRPD Mobility

## 2.3.1 Introduction

Test cases in this section test the functionality for mobility across eHRPD and cdma2000 1x.

## 2.3.2 Dormant 1x to eHRPD System Reselection

### 2.3.2.1 Definition

This test verifies the AT can successfully switch from dormant cdma2000 1x to idle eHRPD. The table below describes the PPP and air interface states:

**Table 1. PPP State for cdma2000 1x to eHRPD mobility**

| **Technology** | **Initial PPP State/Initial Air Interface State** | **Final PPP State/Final Air Interface State** |
|---|---|---|
| cdma2000 1x | Dormant/Idle | Null/Idle |
| eHRPD | Null/Null | Dormant/Idle |

### 2.3.2.2 Traceability:

[2]

Section 5.4.6.1.6 Connected State

Section 5.4.6.1.5 Idle State

[8]

Section 2.6.2 Mobile Station Idle State

### 2.3.2.3 Test Procedure

a. Connect the AT as shown in Figure 1.
    1. RAN1 is eHRPD capable
    2. RAN2 is cdma2000 1x capable
b. Ensure that E-UTRAN system is not available.
c. Ensure the AT does not have a previously established session on the RAN1.
d. Ensure the AT is Idle with no PPP session on RAN2 (cdma2000 1x).
e. Set up a mobile originated Service Option 33 call on AN 2. The air interface shall enter the Mobile Station Control on Traffic Channel State. The PPP session shall be active.
f. Allow the AT to transition to the dormant PPP state and air interface Idle State.

g. Cause the AT to acquire RAN1. This may be done by decreasing attenuation on RAN1 and increasing attenuation on RAN2.

h. Verify the AT acquires RAN1.

i. Verify the AT negotiates the eHRPD session as specified in Section 2.1.2.

j. Initiate a data call on the eHRPD network (Note: The IP continuity will not be maintained after switching from cdma2000 1x to eHRPD). See 2.6.2, 2.7.2, and 2.7.3 for PPP setup procedures.

k. Verify the call is successful and the AT can send/receive data using the eHRPD network.

2.3.2.4 Minimum Standard

The AT shall comply with steps h, i, and k.

2.3.3 Dormant eHRPD to 1x

2.3.3.1 Definition

This test verifies the AT can successfully switch from dormant eHRPD to idle cdma2000 1x. The table below describes the PPP and air interface states:

**Table 2. PPP State for eHRPD to cdma2000 1x mobility**

| **Technology** | **Initial PPP State/Initial Air Interface State** | **Final PPP State/Final Air Interface State** |
|---|---|---|
| cdma2000 1x | Null/Idle | Dormant/Idle |
| eHRPD | Dormant/Idle | Null/Idle |

Steps k-n in this test further verify that the AT is able to maintain the eHRPD session when it returns to the eHRPD network before the session has expired.

2.3.3.2 Traceability:

[2]

Section 5.4.6.1.6 Connected State

Section 5.4.6.1.5 Idle State

[8]

Section 2.6.2 Mobile Station Idle State

2.3.3.3 Test Procedure

a. Connect the AT as shown in Figure 1

1. RAN1 is eHRPD capable
2. RAN2 is cdma2000 1x capable

b. Ensure there is no E-UTRAN available.

c. Ensure the AT establishes an eHRPD Session on RAN1 using the procedure specified in 2.1.2.

d. Ensure the AT is Idle with no PPP session on RAN1.

e. Set up a mobile originated data call on RAN1. The air interface shall enter the Connected State. The PPP state shall be active.

f. Allow the AT to transition to the dormant PPP state and air interface Idle State.

g. Cause the AT to acquire RAN2. This may be done by increasing attenuation on RAN1 and decreasing attenuation on RAN2.

h. Verify the AT acquires RAN2.

i. Initiate a data call on the cdma2000 1x network (Note: The IP continuity will not be maintained after switching from eHRPD to cdma2000 1x).

j. Verify the call is successful and the AT can send/receive data using the cdma2000 1x network.

k. Allow the AT to transition to the dormant PPP state and air interface Idle State.

l. Cause the AT to acquire RAN1. This may be done by decreasing attenuation on RAN1 and increasing attenuation on RAN2. Note this step should occur before the eHRPD session has expired.

m. Cause the AT to access the RAN1.

n. Verify the AT does not negotiate the eHRPD session, i.e. the AT sends a *ConnectionRequest* message but does not send a *UATIRequest* message to the RAN.

#### 2.3.3.4 Minimum Standard

The AT shall comply with steps h, j, and n.

### 2.3.4 Active eHRPD to Idle 1x

#### 2.3.4.1 Definition

This test verifies the AT can successfully switch from active eHRPD to idle 1x. The table below describes the PPP and air interface states:

**Table 3. PPP State for Active eHRPD to cdma2000 1x mobility**

| **Technology** | **Initial PPP State/Initial Air Interface State** | **Final PPP State/Final Air Interface State** |
|---|---|---|
| cdma2000 1x | Null/Idle | Dormant/Idle |
| eHRPD | Active/Connected | Null/Idle |

2.3.4.2 Traceability:

[2]

Section 5.4.6.1.6 Connected State

Section 5.4.6.1.5 Idle State

[8]

Section 2.6.2 Mobile Station Idle State

2.3.4.3 Test Procedure

a. Connect the AT as shown in Figure 1
    1. RAN1 is eHRPD capable
    2. RAN2 is cdma2000 1x capable
b. Ensure there is no E-UTRAN available.
c. Ensure the AT establishes an eHRPD Session on RAN1 using the procedure specified in 2.1.2.
d. Ensure the AT is Idle with no PPP session on RAN1.
e. Set up a mobile originated data call on RAN1. The air interface shall enter the Connected State. The PPP state shall be active.
f. While the PPP state is still active, cause the AT to acquire RAN2. This may be done by increasing attenuation on RAN1 and decreasing attenuation on RAN2.
g. Verify the AT and RAN terminate the active eHRPD call.
h. Verify the AT acquires RAN2.
i. Initiate a data call on the cdma2000 1x network (Note: The IP continuity will not be maintained after switching from eHRPD to cdma2000 1x). The AT may initiate the data call autonomously.
j. Verify the call is successful and the AT can send/receive data using the cdma2000 1x network

2.3.4.4 Minimum Standard

The AT shall comply with steps g, h, and j.

## 2.4 E-UTRAN to eHRPD Handoff

2.4.1 Introduction

Test cases in this section test the functionality for E-UTRAN and eHRPD interworking during system selection and handoffs.

### 2.4.2 E-UTRAN Idle to eHRPD Dormant Handoff – Previous eHRPD Session, No Pre-registration, A13-Session Information transfer available

#### 2.4.2.1 Definition

This test verifies the AT can successfully perform an E-UTRAN Idle to eHRPD dormant handoff. The network and device are not configured to support preregistration. The AT shall have a previous eHRPD session on the source RAN. The source and target AN shall support session transfer. The procedures for the AT to select the E-UTRAN network and for the E-UTRAN network and AT to handoff are outside the scope of this document.

#### 2.4.2.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |
| Section 5.5 | Inter-Rat Overhead Protocol |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[3]

| | |
|---|---|
| Section 13.2.2 | Idle Mode Mobility for E-UTRAN to eHRPD |

#### 2.4.2.3 Test Procedure

a. Connect the device shown in Figure 2. RAN1 and RAN2 are eHRPD ANs on different subnets.

b. Ensure the E-UTRAN network is configured to not allow preregistration.

c. Ensure the AT has a previously established session with the eHRPD RAN1 and is currently dormant. See test case 2.1.2 for procedures regarding eHRPD session negotiation.

d. Ensure that both the eHRPD and E-UTRAN systems are available to the AT.

e. Ensure the AT is currently idle on the E-UTRAN network.

f. Cause the AT to perform cell re-selection to the eHRPD RAN2.

g. Verify that once the AT acquires the eHRPD RAN2, the AT sends a *UATIRequest* message.

h. Ensure that RAN2 sends an A13-Session Information Request to RAN1 to request the session information

i. Ensure that RAN1 sends an A13-Session Information Response to RAN2.

j. Ensure that RAN2 sends a *UATIAssignment* message to the AT

k. Verify the AT sends a *UATIComplete* message.

l. Initiate a data call from the AT to RAN2.

m. Verify that the AT is able to send and receive data using ReservationLabel 0xFF.

#### 2.4.2.4 Minimum Standard

The AT shall comply with steps g, k, and m.

### 2.4.3 E-UTRAN Idle to eHRPD Dormant Handoff – Previous eHRPD Session, No Pre-registration, A13- Session Information transfer not available

#### 2.4.3.1 Definition

This test verifies the AT can successfully perform an E-UTRAN Idle to eHRPD dormant handoff. The network and device are not configured to support preregistration. The AT shall have a previous eHRPD session on the source RAN. The source and target RAN shall not support session information transfer. The procedures for the AT to select the E-UTRAN network and for the E-UTRAN network and AT to handoff are outside the scope of this document.

#### 2.4.3.2 Traceability:

[2]

| | |
|---|---|
| Section 2.3 | Packet Application Negotiation |
| Section 3.1 | Additional Requirement to support eHRPD operation |
| Section 5.5 | Inter-Rat Overhead Protocol |

[6]

| | |
|---|---|
| Section 6.2.6.1.2 | Processing the SessionClose Message |

[3]

| | |
|---|---|
| Section 13.2.2 | Idle Mode Mobility for E-UTRAN to eHRPD |

#### 2.4.3.3 Test Procedure

a. Connect the device shown in Figure 2. RAN1 and RAN2 are eHRPD ANs on different subnets.

b. Ensure the E-UTRAN network is configured to not allow preregistration.

c. Ensure the AT has a previously established session with the eHRPD RAN1 and is currently dormant. See test case 2.1.2 for procedures regarding eHRPD session negotiation.

d. Ensure that both the eHRPD and E-UTRAN systems are available to the AT.

e. Ensure the AT is currently idle on the E-UTRAN network.

f. Cause the AT to perform cell re-selection to the eHRPD RAN2.

g. Verify that once the AT acquires the eHRPD RAN2, the AT sends a *UATIRequest* message.

h. Ensure RAN2 sends a *SessionClose* message to the AT.

i. Verify the AT sends a *SessionClose* message to RAN2.

j. Verify the AT sends a *UATIRequest* message to RAN2.

k. Ensure that RAN2 sends a *UATIAssignment* message to the AT.

l. Verify the AT sends a *UATIComplete* message.

m. Verify that the AT negotiates a new session with the RAN2.

n. Verify the AT completes session negotiation as specified in 2.1.2.

2.4.3.4 Minimum Standard

The AT shall comply with steps g, i, j, l, m and n.

### 2.4.4 Non-optimized Active E-UTRAN to eHRPD Idle – No Preregistration, Connection Release with Redirection Indication

2.4.4.1 Definition

This test verifies that the AT will acquire the eHRPD system after receiving a connection release with redirection indication on the E-UTRAN network.

**Table 4. PPP State for Active E-UTRAN to eHRPD Handoff due to Redirection**

| **Technology** | **Initial PPP State/Initial Air Interface State** | **Final PPP State/Final Air Interface State** |
|---|---|---|
| E-UTRAN | Active/Active | Null/Null |
| eHRPD | Null/Null | Dormant/Idle |

2.4.4.2 Traceability:

[2]

| | |
|---|---|
| Section 3.1 | Additional Requirement to support eHRPD operation |
| Section 5.5 | Inter-Rat Overhead Protocol |

[3]

| | |
|---|---|
| Section 5.4.1.1.1 | IP Address Allocation: VSNCP Configure-Request |
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |
| Section 10.1.4.2 | 3GPP2 VSNCP Configuration-Request |

[9]

| | |
|---|---|
| Section 8.1.4 | RRC Connection Release |

#### 2.4.4.3 Test Procedure

a) Connect the AT as shown in Figure 2. Note that only one eHRPD RAN and one E-UTRAN RAN is needed.

   1) RAN1 is eHRPD capable

   2) RAN3 is E-UTRAN capable

b) The AT may or may not have a previously established session on RAN1. See 2.1.2 for procedures on establishing a new eHRPD session.

c) Ensure the AT is in the ECM_Idle state with no PPP session on RAN3.

d) Set up a mobile originated data call on RAN3. The air interface shall enter the active state. The PPP session shall be active.

e) Cause the AN to send a *RRCConnectionRelease* message directing the AT to RAN1.

f) Verify the AT acquires RAN1.

g) Verify the AT attaches to the eHRPD network. If the AT did not have a previous eHRPD session or the existing session has expired, see 2.1.2 for eHRPD session negotiation.

h) Ensure that the application requesting data connection remains active.

i) Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

   1) PDN Type = IPv4, IPv6, IPv4v6

   2) PDN Address = [Valid IP address of AT for APN]

   3) Attach Type = 3 (Handover)

   4) Protocol Configuration Options = Bearer Control Mode used

   5) Address Allocation Cause = 0 (Null)

j) Initiate a mobile originated data call on the eHRPD network

k) Verify that the IP continuity is maintained after switching from E-UTRAN to eHRPD.

l) Verify the call is successful and the AT can send/receive data using the eHRPD network.

#### 2.4.4.4 Minimum Standard

The AT shall comply with steps f), g), i), k) and l).

### 2.4.5 Non-Optimized Active E-UTRAN to idle eHRPD System Selection – E-UTRAN System Lost – No preregistration

#### 2.4.5.1 Definition

This test verifies that the AT will acquire eHRPD after the E-UTRAN system is lost during an active call on the E-UTRAN network.

**Table 5. PPP State for Active E-UTRAN to eHRPD Handoff due to System Loss**

| Technology | Initial PPP State/Initial Air Interface State | Final PPP State/Final Air Interface State |
|---|---|---|
| E-UTRAN | Active/Active | Null/Null |
| eHRPD | Null/Null | Dormant/Idle |

2.4.5.2 Traceability:

[2]

Section 3.1 Additional Requirement to support eHRPD operation

Section 5.5 Inter-Rat Overhead Protocol

[3]

Section 5.4.1.1.1 IP Address Allocation: VSNCP Configure-Request

Section 10.1.4.1 3GPP2 VSNCP Configuration Options

Section 10.1.4.2 3GPP2 VSNCP Configuration-Request

2.4.5.3 Test Procedure

a. Connect the AT as shown in Figure 2. Note that only one eHRPD RAN and one E-UTRAN RAN is needed.
    1. RAN1 is eHRPD capable
    2. RAN3 is E-UTRAN capable
b. The AT may or may not have a previously established session on the RAN1. See 2.1.2 for procedures on establishing a new eHRPD session.
c. Ensure the AT is in the ECM_Idle state with no PPP session on RAN3.
d. Set up a mobile originated data call on RAN3. The air interface shall enter the active state. The PPP session shall be active.
e. Degrade the RF on RAN3 sufficiently so that the call is dropped and the device enters the system determination. Ensure the RF impairments on RAN3 will prevent the device from acquiring it.
f. Verify the AT acquires RAN1.
g. Verify the AT attaches to the eHRPD network. If the AT did not have a previous eHRPD session or the existing session has expired, see 2.1.2 for eHRPD session negotiation.
h. Initiate a mobile originated data call on the eHRPD network.
i. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

1) PDN Type = IPv4, IPv6, IPv4v6
2) PDN Address = [Valid IP address of AT for APN]
3) Attach Type = 3 (Handover)
4) Protocol Configuration Options = Bearer Control Mode used
5) Address Allocation Cause = 0 (Null)

j. Verify that the IP continuity is maintained after switching from E-UTRAN to eHRPD.

k. Verify the call is successful and the AT can send/receive data using the eHRPD network.

2.4.5.4 Minimum Standard

The AT shall comply with steps f, g, i, j and k.

# 2.5 Dormant eHRPD to Idle E-UTRAN Handoff

2.5.1 Introduction

Test cases in this section test the functionality for eHRPD to E-UTRAN interworking during system selection and handoffs.

2.5.2 Non-optimized Dormant eHRPD to Idle E-UTRAN System Reselection

2.5.2.1 Definition

This test verifies that a device can successfully transition from eHRPD to the E-UTRAN system based on system selection. The system determination algorithm for the device is implementation specific.

**Table 6. PPP State for Dormant eHRPD to E-UTRAN Handoff**

| **Technology** | **Initial PPP State/Initial Air Interface State** | **Final PPP State/Final Air Interface State** |
|---|---|---|
| E-UTRAN | Null/Idle | Dormant/ECM_IDLE |
| eHRPD | Dormant/Idle | Null/Null |

2.5.2.2 Traceability:

[2]

Section 3.1 Additional Requirement to support eHRPD operation

Section 5.5 Inter-Rat Overhead Protocol

[3]

Section 5.4.1.1.1 IP Address Allocation: VSNCP Configure-Request

Section 10.1.4.1 3GPP2 VSNCP Configuration Options

Section 10.1.4.2 3GPP2 VSNCP Configuration-Request

Section 2.3 Packet Application Negotiation

2.5.2.3 Test Procedure

a. Connect the AT as shown in Figure 2. Note that only one eHRPD RAN and one E-UTRAN RAN is needed.
    1. RAN1 is eHRPD capable
    2. RAN3 is E-UTRAN capable
b. Ensure there is no E-UTRAN available.
c. The AT may or may not have a previously established session on RAN1. See 2.1.2 for procedures on establishing a new eHRPD session.
d. Ensure the AT is Idle with no PPP session on RAN1.
e. Set up a mobile originated data call on RAN1. The air interface shall enter the Connected State. The PPP session shall be active.
f. Allow the AT to transition to the dormant PPP state and air interface Idle State.
g. Cause the AT to acquire RAN3. This may be achieved by increasing attenuation on RAN1 and decreasing attenuation on RAN3. Note: The algorithm used by the device for system selection is implementation dependent. There can be multiple triggers for acquiring RAN3. For example, a device may use better system reselection procedures to periodically search for preferred systems or the device may lose coverage of RAN1 and start a new system search. These requirements are operator dependent and all applicable scenarios should be executed.
h. Verify the AT acquires RAN3.
i. Verify the AT attaches to the E-UTRAN network.
j. Initiate a mobile originated data call on the E-UTRAN network.
k. Verify the IP continuity is maintained after switching from eHRPD to E-UTRAN.
l. Verify the call is successful and the AT can send/receive data using the E-UTRAN network.

2.5.2.4 Minimum Standard

The AT shall comply with steps h, i, k, and l.

## 2.6 PPP Based Main-Service Connection Establishment

2.6.1 Introduction

Tests included in this section verify PPP session establishment and authentication procedures. It is assumed that E-UTRAN is unavailable.

### 2.6.2 EAP AKA' Authentication during Initial PPP session establishment

#### 2.6.2.1 Definition

This test verifies that EAP is successfully negotiated as the authentication protocol and EAP-AKA' authentication is successful during PPP session establishment in eHRPD.

#### 2.6.2.2 Traceability:

[3]

| | |
|---|---|
| Section 3.1 | Definitions |
| Section 5.2.1 | EAP Protocol Negotiation |
| Section 5.2.2.1 | UE Identity Management |
| Section 5.2.2.2 | UE Network Access Authentication |
| Section 10.1.1 | Establishment of a Main-Service Connection |
| Section 10.1.3 | PPP Based Main-Service Connection |

#### 2.6.2.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Ensure that the AT is in inactive/NULL state, i.e. no PPP session exists between the AT and the HSGW.

c. Ensure that the AT establishes an eHRPD session with the AN, i.e. the AT has accepted a value of 0x07 for the ProtocolID field of FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.

d. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT.

e. Verify that the AT sends a LCP-Configure-Request message to the HSGW.

f. Ensure that the HSGW sends a LCP-Configure-Ack message to the AT.

g. Ensure that the HSGW sends a LCP-Configure-Request message with Authentication-Protocol option set to C227 (EAP).

h. Verify that the AT sends a LCP-Configure-Ack message to the HSGW and accepts EAP based authentication.

i. Instruct the HSGW to send an EAP Request/Identity to the AT.

j. Verify that the AT sends an EAP Response / Identity with Identity='IMSI-NAI' to the HSGW.

k. Ensure that the HSGW sends an EAP-Request/AKA'-Challenge to the AT. Ensure that the AMF separation bit is set to 1 and that other fields such as AUTN are set correctly.

l. Verify that the AT sends an EAP-Response/AKA'-Challenge carrying the MAC and the RES fields.

m. If the AT receives an EAP-Request/AKA'-Notification message from the HSGW, verify that the AT sends an EAP-Response/AKA'-Notification message to the HSGW. Verify that the fields included in the EAP-Response/AKA'-Challenge are correct. This can be verified if the HSGW sends an EAP-Success to the AT.

#### 2.6.2.4 Minimum Standard

The AT shall comply with steps e, h, j, l, and m.

### 2.6.3 EAP AKA' Authentication Failure during Initial PPP session establishment (Incorrect AUTN)

#### 2.6.3.1 Definition

This test verifies AT behavior when EAP AKA' authentication failure occurs during PPP session negotiation in eHRPD establishment.

#### 2.6.3.2 Traceability:

[3]

| | |
|---|---|
| Section 3.1 | Definitions |
| Section 5.2.1 | EAP Protocol Negotiation |
| Section 5.2.2.1 | UE Identity Management |
| Section 5.2.2.2 | UE Network Access Authentication |
| Section 10.1.1 | Establishment of a Main-Service Connection |
| Section 10.1.3 | PPP Based Main-Service Connection |

#### 2.6.3.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Ensure that the AT is in inactive/NULL state, i.e. no PPP session exists between the AT and the HSGW.

c. Ensure that the AT establishes an eHRPD session with the AN, i.e. the AT has accepted a value of 0x07 for the ProtocolID field of FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFF.

d. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT.

e. Ensure that the AT sends a LCP-Configure-Request message to the HSGW.

f. Ensure that the HSGW sends a LCP-Configure-Ack message to the AT.

g. Ensure that the HSGW sends a LCP-Configure-Request message with Authentication-Protocol option set to C227 (EAP).

h. Ensure that the AT sends a LCP-Configure-Ack message to the HSGW and accept EAP based authentication.

i. Instruct the HSGW to send an EAP-Request/AKA'-Challenge to the AT with AUTN field set incorrectly.

j. Verify that the AT sends an EAP-Response/AKA-Authentication-Reject to the HSGW.

k. Ensure that the HSGW sends an EAP-Failure to the AT.

l. Verify that the AT sends a LCP-Term-Request to the HSGW.

m. If the AT supports cdma2000 1x and cdma2000 1x system is available, the subsequent call may be placed over cdma2000 1x system. Note that this behavior is implementation dependent.

n. If the AT and the RAN support HRPD, the subsequent call may be placed over HRPD system. Note that this behavior is implementation dependent. For example, HRPD based personality may be negotiated or a new HRPD session may be negotiated.

o. If the AT supports fallback to cdma2000 1x or HRPD, verify that the AT obtains an IP address from the PDSN and is able to send and receive best effort data.

#### 2.6.3.4 Minimum Standard

The AT shall comply with steps j and l.

The AT should comply with step o.

## 2.7 IP Address Assignment and PDN Attach and Detach Procedures

### 2.7.1 Introduction

This section contains tests for IP address assignment and PDN attach and Detach procedures.

### 2.7.2 IPv4 address assignment through VSNCP

#### 2.7.2.1 Definition

This test verifies that the AT can use VSNCP to obtain an IPv4 address from the eHRPD HSGW. The test is applicable to ATs that support IPv4.

#### 2.7.2.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |

| | |
|---|---|
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

2.7.2.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4 address.

c. Ensure that the AT does not have an IPv4 address assigned from the network. Note, this step may require HSGW to send a PPP VSNCP Terminate-Request.

d. If the AT has an open session with the RAN, instruct the RAN to send a *SessionClose* message to the AT and ensure that the AT sends a *SessionClose* message to the RAN.

e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the session negotiation is successful.

g. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT.

h. Ensure that the AT has been successfully authenticated and the HSGW sends an EAP-Success message to the AT.

i. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

    1) PDN Address = 0

    2) IPv4 Default Router Address= 0.0.0.0

    3) Attach Type = Initial

    4) PDN-ID

    5) PDN type = 1 or 3.

j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4 address and the PDN-ID.

k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

l. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

m. Verify that the AT can send and receive data for the assigned IPv4 address using the PDN-ID used by the AT in step i.

#### 2.7.2.4 Minimum Standard

The AT shall comply with steps i, l, and m.

### 2.7.3 IPv6 address assignment through VSNCP

#### 2.7.3.1 Definition

This test verifies that the AT can use VSNCP to obtain an IPv6 address from the eHRPD HSGW. The test is applicable to ATs that support IPv6.

#### 2.7.3.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.1.1.1 | IP Address Allocation: VSNCP Configure-Request |
| Section 5.4.5.4 | IP Address Allocation: VSNCP Configure-Ack |
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

#### 2.7.3.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Configure the PDN-GW to assign IPv6 address and disable DHCP support at the HSGW.

c. Ensure that Router Advertisement broadcast is disabled at the HSGW. Note, if step n, is not supported, the test should be repeated with Router Advertisement broadcast is enabled at the HSGW.

d. Ensure that the AT does not have an IPv6 address assigned from the network. Note, this step may require HSGW to send a PPP VSNCP Terminate-Request.

e. If the AT has an open session with the RAN, instruct the RAN to send a *SessionClose* message to the AT and ensure that the AT sends a *SessionClose* message to the RAN.

f. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

g. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the session negotiation is successful.

h. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT.

i. Ensure that the AT has been successfully authenticated and the HSGW sends an EAP-Success message to the AT.

j. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

    1. PDN Address = 0
    2. Attach Type = Initial
    3. PDN-ID
    4. PDN type = 2 or 3.

k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv6 Interface Identifier in the PDN address field and the PDN-ID.

l. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

m. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

n. If the AT does not receive Router Advertisement message from the HSGW, verify that the AT sends a Router Solicitation message to the HSGW.

o. Ensure that the HSGW sends a Router Advertisement message containing the IPv6 home network prefix.

p. Verify that the AT can send and receive data for the assigned Ipv6 address using the PDN-ID used by the AT in step j.

#### 2.7.3.4 Minimum Standard

The AT shall comply with steps j, m, and p.

AT should comply with steps n.

### 2.7.4 HSGW initiated PDN release through VSNCP

#### 2.7.4.1 Definition

This test verifies that the AT supports PDN detach procedures through VSNCP, when the HSGW initiates these procedures.

#### 2.7.4.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 11.2 | Network Initiated Detach and PDN Disconnection Procedure |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

2.7.4.3 Test Procedure

a. Ensure that the AT can send and receive data on assigned IPv4/IPv6 address received from a PDN.

b. Ensure that the AT is transmitting data for the PDN in step a.

c. Cause the HSGW to send a VSNCP Terminate Request containing the PDN-ID for the PDN used in step a.

d. Verify that the AT sends a VSNCP Terminate Ack message containing the PDN-ID.

e. Verify that the AT stops transmitting data with the PDN-ID used in step c.

f. If the AT supports IPv4v6 repeat the test with the following changes:

    1. In step a, ensure that the AT receives a dual IP address assignment from the PDN-GW.

    2. In step b, ensure that the AT is sending data using IPv4 and IPv6 addresses assigned by the PDN-GW.

    3. In step e, verify that the AT stops sending data using IPv4 address and IPv6 address assigned by the PDN-GW.

2.7.4.4 Minimum Standard

The AT shall comply with steps d and e.

2.7.5 Access Terminal initiated PDN release through VSNCP

2.7.5.1 Definition

This test verifies that the AT supports PDN detach procedures through VSNCP or LCP, when the AT initiates these procedures.

2.7.5.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |

| | |
|---|---|
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 11.1 | UE Initiated Detach and UE-Requested PDN Disconnection Procedure |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

#### 2.7.5.3 Test Procedure

a. Cause the AT to establish connection with two PDN-GWs (PDN-GW1 and PDN-GW2). If the AT supports IPv4 and IPv6, PDN-GW2 should assign IPv4 and IPv6 address to the AT.

b. Ensure that the AT can send and receive data on assigned IPv4/IPv6 addresses using PDN-IDs for PDN-GW1 and PDN-GW2.

c. Cause the AT to send a VSNCP Terminate Request containing the PDN-ID of PDN-GW1. Note this can be triggered by closing all the applications using the PDN-GW1.

d. Ensure that the network sends a VSNCP Terminate Ack message containing the PDN-ID of PDN-GW1.

e. Cause the AT to send a VSNCP Terminate Request containing the PDN-ID of PDN-GW2 or an LCP-Term-Request. Note this can be triggered by closing all the applications that are using the PDN-GW2.

f. Cause the AT to restart the applications that used PDN-GW1 and PDN-GW2 in step a.

g. Verify that the AT sends a VSNCP Configure Request message requesting an IP address from the PDN-GW1 and PDN-GW2.

#### 2.7.5.4 Minimum Standard

The AT shall comply with step g.

### 2.7.6 Network Initiated PDN resynchronization VSNCP

#### 2.7.6.1 Definition

This test verifies that the AT supports PDN resynchronization procedures through VSNCP, when the network initiates these procedures.

#### 2.7.6.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |

| | |
|---|---|
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 11.2 | Network Initiated Detach and PDN Disconnection Procedure |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

#### 2.7.6.3 Test Procedure

a. Ensure that the AT can send and receive data using the assigned IPv4/IPv6 address and using PDN-ID.

b. Ensure that the AT is transmitting data containing PDN-ID.

c. Cause the HSGW to send a VSNCP Configure Request containing the PDN-ID.

d. Verify that the AT sends a VSNCP Configure Request message containing the PDN-ID, APN, PDN Address, Protocol Configuration Options, and AttachType set to Handover.

e. Ensure that the HSGW sends the VSNCP Configure Ack message containing the PDN-ID, APN, PDN Address, Protocol Configuration Options, and Attach Type set to Handover to the AT. The message may contain new parameters for the PDN connection.

f. Verify that the AT sends VSNCP Configure Ack message containing the PDN-ID in step e.

#### 2.7.6.4 Minimum Standard

The AT shall comply with steps d and f.

### 2.7.7 PPP Renegotiation upon Inter-HSGW handoff

#### 2.7.7.1 Definition

This test verifies that the AT renegotiates the PPP upon inter-HSGW handoff if it receives a LCP Configure Request message from the RAN. The procedure is applicable when the HSGW do not have an H1/H2 connectivity.

#### 2.7.7.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |

| | |
|---|---|
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 12.3 | Intra-eHRPD Handover with HSGW Relocation without Context Transfer |

2.7.7.3 Test Procedure

a. Connect RAN1 and RAN2 to HSGW1 and HSGW2 respectively as shown in Figure 1. Both RAN1 and RAN2 are eHRPD capable..

b. Ensure that the AT is connected to RAN1 can send and receive data using the assigned IPv4/IPv6 address and using a PDN-ID.

c. Ensure that the AT is transmitting data containing the PDN-ID.

d. Cause the AT to handoff to RAN2.

e. Ensure that the session transfer is completed in RAN2.

f. Instruct the HSGW2 to send a LCP-Configure-Request message with Authentication-Protocol option set to C227 (EAP).

g. Verify that the AT sends a LCP-Configure-Ack message to the HSGW2 and accepts EAP based authentication.

h. Instruct the HSGW2 to send an EAP Request/Identity to the AT.

i. Verify that the AT sends an EAP Response / Identity with Identity='IMSI-NAI' to HSGW2.

j. Ensure that HSGW2 sends an EAP-Request/AKA'-Challenge to the AT. Ensure that the AMF separation bit is set to 1 and that other fields such as AUTN are set correctly.

k. Verify that the AT sends an EAP-Response/AKA'-Challenge carrying the MAC and the RES fields.

l. If the AT receives an EAP-Request/AKA'-Notification message from HSGW2, verify that the AT sends an EAP-Response/AKA'-Notification message to HSGW2.

m. Verify that the fields included in the EAP-Response/AKA'-Challenge are correct. This can be verified if HSGW2 sends an EAP-Success to the AT.

n. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

    1) Attach Type = handover

o. Ensure that the HSGW2 sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4/IPv6 address and the PDN-ID.

p. Ensure that the HSGW2 sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

q. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW2.

r. Verify that the AT can send and receive data for the assigned IPv4/IPv6 address using the PDN-ID.

#### 2.7.7.4 Minimum Standard

The AT shall comply with step g, i, k, m, n, q, and r.

### 2.7.8 eHRPD loss and re-acquisition before expiration of PPP timer

#### 2.7.8.1 Definition

This test verifies that an eHRPD capable AT is able to re-acquire the network and exchange data using the same PPP connection when it loses the system. The test is in absence of E-UTRAN.

#### 2.7.8.2 Traceability

[2]

| | |
|---|---|
| Section 3.1 | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 9 | MAC Layer |

#### 2.7.8.3 Test Procedure

a. Connect the eHRPD capable AT to eHRPD RAN. Use session negotiation and establishment procedures are outlined in previous contributions 2.1.2, 2.7.2, and 2.7.3.

b. Initiate an eHRPD packet data call on the AT.

c. Start an application that sends data in both directions and verify exchange of data.

d. Attenuate the RAN air link temporarily so as to cause the AT to lose the system.

e. Verify the AT drops the call and is no longer attached to the system.

f. Cause the AT to re-acquire the system.

g. Verify the PPP connection has stayed the same as before.

h. Initiate an eHRPD packet data call on the AT by sending a *ConnectionRequest* message to the RAN.

i. Verify the receipt of the *TrafficChannelAssignment* message at the AT and correct set up of the traffic channels.

j. Start an application that sends data in both directions and verify exchange of data.

#### 2.7.8.4 Minimum Standard

The AT shall comply with steps c, e, g, i, and j.

### 2.7.9 Dual IP address (IPv4 and IPv6) assignment through VSNCP

#### 2.7.9.1 Definition

This test verifies that the AT can use VSNCP to simultaneously obtain an IPv4 address and an IPv6 address from a PDN. The test is applicable to ATs that support IPv6.

#### 2.7.9.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

#### 2.7.9.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4 and IPv6 address to an AT that supports both IPv4 and IPv6.

c. Ensure that the AT does not have IPv4 or IPv6 address assigned from the HSGW. Note, this step may require HSGW to send a PPP VSNCP Terminate-Request or LCP-Term request.

d. If the AT has an open session with the RAN, instruct the RAN to send a *SessionClose* message to the AT and ensure that the AT sends a *SessionClose* message to the RAN.

e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the session negotiation is successful.

g. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT. Ensure that the application supports IPv4 address.

h. Ensure that the AT has been successfully authenticated and the HSGW sends an EAP-Success message to the AT.

i. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

   1) PDN Address = 0

   2) IPv4 Default Router Address= 0.0.0.0

   3) Attach Type = Initial

   4) PDN-ID

   5) PDN type = 3.

j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the PDN-ID, and IPv4 address as well as the IPv6 Interface Identifier in the PDN address field.

k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

l. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

m. If the AT does not receive Router Advertisement message from the HSGW, verify that the AT sends a Router Solicitation message to the HSGW.

n. Ensure that the HSGW sends a Router Advertisement message containing the IPv6 home network prefix.

o. Start an application that requires IPv6 support and connects to the same PDN-GW as the application in step g.

p. Verify that the AT can send and receive data for the assigned IPv4 and IPv6 addresses using PDN-ID used in step i.

#### 2.7.9.4 Minimum Standard

The AT shall comply with steps i, l, m, and p.

### 2.7.10 UICC based APN connectivity

#### 2.7.10.1 Definition

This test verifies that the AT does not attempt to connect to an APN that is disabled in the UICC.

#### 2.7.10.2 Traceability

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |

| | |
|---|---|
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

2.7.10.3 Test Procedure

a. Perform test procedure for test 2.7.2 (IPv4 address assignment through VSNCP) or 2.7.3 (IPv6 address assignment through VSNCP) except that a non-default PDN-GW may be used. Note, default PDN gateway may be used if the associated APN can be disabled in step d.

b. Close all applications that require connectivity to the PDN-GW in step a.

c. Ensure that the AT sends a VSNCP Terminate Request for the PDN-GW in step a and that the HSGW sends a VSNCP Terminate-Ack message to the AT.

d. Disable the APN associated to the PDN-GW in step a in the UICC. This can be accomplished through multiple ways such as via provisioning. Note, if an APN is not listed in the UICC then it is assumed to be enabled. Further, the AT will need to be power cycled to ensure that the new UICC parameters take effect.

e. Start the same application that generated VSNCP Configure Request for connectivity to the PDN-GW in step a.

f. Verify that the AT does not generate the VSNCP Configure Request for the PDN-GW used in step a.

2.7.10.4 Minimum Standard

The AT shall comply with step f.

2.7.11 PDN Release based on Inactivity Timer

2.7.11.1 Definition

This test verifies that the AT releases a PDN connection after a period of inactivity. The setting of the PDN Inactivity timer is implementation dependent.

2.7.11.2 Traceability

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |

| | |
|---|---|
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

2.7.11.3 Test Procedure

a. Configure the PDN Inactivity timer to be a small value. A recommended value for test is 2 minutes.

b. Perform test procedure for test 2.7.2 (IPv4 address assignment through VSNCP) or 2.7.3 (IPv6 address assignment through VSNCP).

c. Ensure that application requiring connectivity to PDN-GW in step b is not closed.

d. Ensure that there is no data sent or received for the PDN-GW to which the AT connected to in step b for a period of PDN Inactivity timer.

e. Verify that the AT sends a VSNCP Terminate Request for the PDN-GW in step b. Note, if this is the only PDN connection, the AT may send a LCP Termination Request without sending the VSNCP Term-Req.

2.7.11.4 Minimum Standard

The AT should comply with step e.

2.7.12 PDN Application Blocking for Dual IP PDN

2.7.12.1 Definition

This test verifies that if an AT has an IP address assigned from a PDN capable of dual IP address assignment, the AT does not generate a VSNCP Configure request for the second IP address assignment if it already has an IP address assigned. The test procedure below requires configuration at the PDN-GW to provide only an IPv4 address. The objective is to test the blocking of either IPv4 or IPv6 application, and as an alternate procedure PDN-GW may be configured to provide only an IPv6 address and IPv4 application blocking may be verified instead.

2.7.12.2 Traceability

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |

Section 10.1.4.6 3GPP2 VSNCP Terminate-Request

Section 10.1.4.7 3GPP2 VSNCP Terminate-Ack

2.7.12.3 Test Procedure

a. Perform test procedure for test 2.7.2 (IPv4 address assignment through VSNCP).

b. Close the application and ensure that the AT sends a VSNCP Terminate Request for the PDN-GW in step a and receives a VSNCP Terminate-Ack. Note AT may send a LCP-Term Request in place of VSNCP Terminate Request.

c. Perform test procedure for test 2.7.3 (IPv6 address assignment through VSNCP) except that the same PDN-GW as in step a is used.

d. Close the application and ensure that the AT sends a VSNCP Terminate Request for the PDN-GW in step a and receives a VSNCP Terminate-Ack. Note AT may send a LCP-Term Request in place of VSNCP Terminate Request.

e. Configure the PDN-GW used in step a to assign only an IPv4 address.

f. Repeat step a and ensure that the AT receives only an IPv4 address from the PDN-GW. Note that the AT may send Router Solicitation Messages if it does not receive an IPv6 address.

g. While the IPv4 application is active start the IPv6 application used in step c.

h. Verify that the AT does not generate a VSNCP Configure Request for the IPv6 application.

2.7.12.4 Minimum Standard

The AT should comply with step h.

## 2.8 PDN Multiplexing and QoS Establishment

2.8.1 Introduction

Tests in this section verify PDN multiplexing for multiple PDN with SO 59 and QoS establishment with SO 64 or 67.

2.8.2 PDN Multiplexing on the Main Service Connection over SO 59

2.8.2.1 Definition

This test verifies that the AT inserts the PDN-ID to support PDN multiplexing when SO 59 is used to carrying BE data for multiple PDN. Note, although the test procedure specifies IPv4 address allocation the test may be conducted with IPv6 address when supported by the mobile station.

2.8.2.2 Traceability

[3]

Section 4.5 Protocol Stacks

| | |
|---|---|
| Section 5.5.1 | The EPS Bearer with PMIP-based S2a and eHRPD Access |
| Section 6.4.1 | S2a Connection Establishment with the Default PDN |
| Section 10 | Interface between the HSGW and the UE |
| Section 10.1 | Main service connection between UE and HSGW |
| Section 10.1.3 | PPP-Based Main Service Connection |
| Section 10.1.5 | 3GPP2 Vendor Specific Network Protocol (VSNP) Packet Format |
| Section 10.2 | Auxiliary service connections between UE and HSGW |

[2]

| | |
|---|---|
| Section 3.1 | Additional Requirements to Support eHRPD operation |

2.8.2.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4 address.

c. Ensure that the AT does not have an IPv4 address assigned from the HSGW. Note, this step may require HSGW to send a PPP VSNCP Terminate-Request.

d. If the AT has an open session with the AN, instruct the RAN to send a *SessionClose* message to the AT and ensure that the AT sends a *SessionClose* message to the RAN.

e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the session negotiation is successful.

g. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT.

h. Ensure that the AT has been successfully authenticated and the HSGW sends an EAP-Success message to the AT.

i. Ensure that that the AT sends PPP: VSNCP-Configure-Request message containing the PDN-ID selected by the AT.

j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4 address and PDN-ID.

k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing PDN-ID to the AT.

l. Ensure that the AT sends a VSNCP-Configure-Ack message containing PDN-ID to the HSGW.

m. Verify that the AT can send and receive data for the assigned IPv4 address using the PDN-ID used in step i.

n. Verify that for the BE traffic being sent for the default PDN connection the AT places the PDN-ID used in step i in the VSNP header and that the AT sends data using RLP Flow Id 0.

o. Activate an application at the AT that requires connectivity with an additional PDN. If the AT supports IPv4 and IPv6, then a PDN that supports both IPv4 and IPv6 should be used.

p. Verify that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

    1) PDN-ID
    2) Access Point Name (APN)
    3) PDN Type
    4) PDN Address
    5) Protocol Configuration Options
    6) Attach Type = Initial

    If the AT supports both IPv4 and IPv6, verify that the PDN type = 3 (IPv4v6) is included in the request.

q. Verify that the PDN-ID included in PPP: VSNCP-Configure-Request message is different than the one used in step i.

r. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4 address and the PDN-ID. If the AT included PDN type = 3 in the PPP: VSNCP-Configure-Request message in step p, ensure that the HSGW also includes an IPv6 Interface Identifier in the PDN address field.

s. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

t. Verify that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

u. Verify that the AT can send and receive data for the assigned IPv4 address using the PDN-ID used in step p.

v. If the HSGW included an IPv6 Interface Identifier in the PPP: VSNCP-Configure-Ack message in step r, ensure that the AT receives a Router Advertisement message from the HSGW. Note the AT may send a Router Solicitation message to the HSGW.

w. Verify that for the BE traffic being sent for the non-default PDN connection the AT places the PDN-ID sent in step r in the VSNP header and that the AT sends data using RLP Flow Id 0. If the AT received dual IP address assignment from the non-default PDN, verify the BE transfer for both IPv4 and IPv6 addresses.

2.8.2.4 Minimum Standard

The AT shall comply with steps m, n, p, q, u, and w.

2.8.3 PDN Multiplexing on Auxiliary Service Connection over SO 72

2.8.3.1 Definition

This test verifies that the AT inserts the PDN-ID to support PDN multiplexing when SO 72 is used for carrying BE data (0xFF and 0xFE) for multiple PDN. Note, although the test procedure specifies IPv4 address allocation the test may be conducted with IPv6 address when supported by the mobile station. Support for this test is optional at the ATs.

2.8.3.2 Traceability:

[3]

| | |
|---|---|
| Section 4.5 | Protocol Stacks |
| Section 5.5.1 | The EPS Bearer with PMIP-based S2a and eHRPD Access |
| Section 6.4.1 | S2a Connection Establishment with the Default PDN |
| Section 10 | Interface between the HSGW and the UE |
| Section 10.1 | Main service connection between UE and HSGW |
| Section 10.1.3 | PPP-Based Main Service Connection |
| Section 10.1.5 | 3GPP2 Vendor Specific Network Protocol (VSNP) Packet Format |
| Section 10.2 | Auxiliary service connections between UE and HSGW |

[2]

| | |
|---|---|
| Section 3.1 | Additional Requirements to Support eHRPD operation |

2.8.3.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4 address.

c. Ensure that the AT does not have an IPv4 address assigned from the network. Note, this step may require HSGW to send a PPP VSNCP Terminate-Request.

d. If the AT has an open session with the RAN, instruct the RAN to send a *SessionClose* message to the AT and ensure that the AT sends a *SessionClose* message to the AN.

e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the session negotiation is successful.

g. Ensure that during session negotiation the AT includes a value of 0x07 and 0x08 for the ProtocolSupported field in the ATSupportedFlowProtocolParametersPP attribute of EMPA.

h. Ensure that during session negotiation the RAN proposes a value of 0x08 for the ProtocolID field of the FlowNNFlowProtocolParametersFwd and FlowNNFlowProtocolParametersRev attributes of the EMPA Link Flow bound to ReservationLabel 0xFE. Ensure that the link flow NN is active.

i. Configure the HSGW to establish flow 0xFE on a PDN-Mux auxiliary A10 as SO 72.

j. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT.

k. Ensure that the AT has been successfully authenticated and the HSGW sends an EAP-Success message to the AT.

l. Ensure that that the AT sends PPP: VSNCP-Configure-Request message containing the PDN-ID used by the AT.

m. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4 address and the PDN-ID.

n. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT. The value of the PDN-ID is copied from step l.

o. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

p. Verify that the AT can send and receive BE packet stream data for the assigned IPv4 address using the PDN-ID assigned by the AT in step l.

q. Verify that for the packet stream BE traffic being sent for the default PDN connection the AT places the PDN-ID received in step n in the extra octet ahead of IP packet and that the AT sends packet stream data (0xFE) using RLP Flow Id NN used in step h.

r. Activate an application at the AT that requires connectivity with an additional PDN.

s. Ensure that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

    1) PDN-ID

    2) Access Point Name (APN)

    3) PDN Type

    4) PDN Address

    5) Protocol Configuration Options

    6) Attach Type = Initial

t. Ensure that the PDN-ID included in PPP: VSNCP-Configure-Request message is different than the one used in l.

u. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4 address and the PDN-ID.

v. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

w. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

x. Verify that the AT can send and receive data for the assigned IPv4 address using the PDN-ID used by the PDN-GW in step t.

y. Verify that for the octet and packet stream BE traffic being sent for the non-default PDN connection the AT places the PDN-ID received in step v in the VSNP header and that the AT sends octet stream data (0xFF) using RLP Flow Id 0.

#### 2.8.3.4 Minimum Standard

The AT shall comply with steps p, q, and y.

### 2.8.4 QoS Establishment and PDN ID over SO 64 or SO 67

#### 2.8.4.1 Definition

This test verifies AT initiated QoS establishment and the PDN ID insertion in upper 4 bits of the ReservationLabel when SO 64 or SO 67 is used.

#### 2.8.4.2 Traceability

[3]

| | |
|---|---|
| Section 4.5 | Protocol Stacks |
| Section 5.5.1 | The EPS Bearer with PMIP-based S2a and eHRPD Access |
| Section 6.4.1 | S2a Connection Establishment with the Default PDN |
| Section 10 | Interface between the HSGW and the UE |
| Section 10.1 | Main service connection between UE and HSGW |
| Section 10.1.3 | PPP-Based Main Service Connection |
| Section 10.1.5 | 3GPP2 Vendor Specific Network Protocol (VSNP) Packet Format |
| Section 10.2 | Auxiliary service connections between UE and HSGW |
| Section 5.5 | Quality of Service |
| Section 5.5.4 | UE Initiated Dedicated Bearer Procedures for eHRPD |
| Section 5.5.4.1.1 | UE Requested Bearer Resource Allocation |

Section 5.6.6 Mapping of QoS parameters between 3GPP and 3GPP2

[2]

Section 3.1 Additional Requirements to Support eHRPD operation

2.8.4.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4 address.

c. Ensure that the AT does not have an IPv4 address assigned from the network. Note, this step may require HSGW to send a PPP VSNCP Terminate-Request.

d. If the AT has an open session with the RAN, instruct the RAN to send a *SessionClose* message to the AT and ensure that the AT sends a *SessionClose* message to the RAN.

e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the session negotiation is successful.

g. Cause the AT to start the PPP session establishment. This can be triggered by starting an application that requires data transmission by the AT.

h. Ensure that the AT has been successfully authenticated and the HSGW sends an EAP-Success message to the AT.

i. Ensure that that the AT sends PPP: VSNCP-Configure-Request message containing the PDN-ID selected by the AT.

j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4 address and the PDN-ID.

k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT The value of the PDN-ID is copied from step i.

l. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

m. Verify that the AT can send and receive data for the assigned IPv4 address using the PDN-ID requested by the AT in step i.

n. Verify that for the BE traffic being sent for the default PDN connection the AT places the PDN-ID received in step k in the VSNP header and that the AT sends data using RLP Flow Id 0.

o. Activate an application at the AT that requires connectivity with an additional PDN and QoS.

p. If the application in step o requested connectivity with the non-default PDN, ensure that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

    1) PDN-ID
    2) Access Point Name (APN)
    3) PDN Type
    4) PDN Address
    5) Protocol Configuration Options
    6) Attach Type = Initial

q. If the application in step o requested connectivity with the non-default PDN, ensure that the PDN-ID included in PPP: VSNCP-Configure-Request message is different than the one used in step i.

r. If the application in step o requested connectivity with the non-default PDN, ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the IPv4 address and the PDN-ID.

s. If the application in step o requested connectivity with the non-default PDN, ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

t. If the application in step o requested connectivity with the non-default PDN, ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

u. Verify that the AT sends a VSNP: Resv message and includes the PDN-ID to which the QoS application needs to connect. Verify that the AT includes the ProfileID list, TFT, Opcode= QoS-Check, and a transaction ID in the Resv message.

v. Ensure that the HSGW sends a VSNP: ResvConf message to the AT with OpCode set to ‘QoS Check Confirm’ and includes the TFT and the authorized R-QoS-Sub-BLOB and the TransactionID that was sent in the Resv message.

w. Ensure that the RAN and AT activate the forward and reverse link flows to which the reservation is mapped.

x. Verify that the AT sends a VSNP: Resv message and includes the TFT, Flow ID, and the transaction ID that is different than the one used in step u.

y. Ensure that the HSGW sends a ResvConf message.

z. Verify that the AT sends a *ReservationOnRequest* message if the Reservation is not on.

aa. Verify that the AT sends and receives the data for the QoS Flow and inserts the PDN-ID in the upper 4 bits of the ReservationLabel.

#### 2.8.4.4 Minimum Standard

The AT shall comply with steps m, n, u, x, z, and aa.

### 2.8.5 QoS Establishment for Dual IP address (IPv4 and IPv6) assignment

#### 2.8.5.1 Definition

This test verifies that when a PDN assigns dual IP addresses to an AT, applications with QoS requirements that use these addresses establish their own TFT filters.

#### 2.8.5.2 Traceability:

[3]

| | |
|---|---|
| Section 5.4.5.1 | IPv4 Address Allocation during PDN Connection Establishment |
| Section 5.4.5.4 | IPv6 Address Allocation |
| Section 10.1.4.1 | 3GPP2 VSNCP Configuration Options |
| Section 10.1.4.2 | 3GPP2 VSNCP Configure-Request |
| Section 10.1.4.3 | 3GPP2 VSNCP Configure-Ack |
| Section 10.1.4.6 | 3GPP2 VSNCP Terminate-Request |
| Section 10.1.4.7 | 3GPP2 VSNCP Terminate-Ack |

#### 2.8.5.3 Test Procedure

a. Ensure that eHRPD system is available to the AT and E-UTRAN system is unavailable to the AT.

b. Configure the HSGW to disable the DHCP support and the PDN-GW to assign IPv4 address.

c. Ensure that the AT does not have an IPv4 address assigned from the network. Note, this step may require HSGW to send a PPP VSNCP Terminate-Request.

d. If the AT has an open session with the RAN, instruct the RAN to send a *SessionClose* message to the AT and ensure that the AT sends a *SessionClose* message to the RAN.

e. Ensure that the AT has eHRPD IMSI and credentials (authentication keys) provisioned.

f. Cause the AT to negotiate a new eHRPD session with the RAN and ensure that the session negotiation is successful.

g. Cause the AT to start the PPP session establishment. This can be triggered by starting an application (IPv4 based application) that requires data transmission by the AT. Ensure that the application supports IPv4 address, has QoS requirements that will trigger a Resv message (see step o below).

h. Ensure that the AT has been successfully authenticated and the HSGW sends an EAP-Success message to the AT.

i. Ensure that the AT sends PPP: VSNCP-Configure-Request message containing the following fields:

    1) PDN Address = 0

    2) IPv4 Default Router Address= 0.0.0.0

    3) Attach Type = Initial

    4) PDN-ID

    5) PDN type = 3.

j. Ensure that the HSGW sends a PPP: VSNCP-Configure-Ack message to the AT containing the PDN-ID, and IPv4 address as well as the IPv6 Interface Identifier in the PDN address field.

k. Ensure that the HSGW sends a PPP: VSNCP-Configure-Request message containing the PDN-ID to the AT.

l. Ensure that the AT sends a VSNCP-Configure-Ack message containing the PDN-ID to the HSGW.

m. If the AT does not receive Router Advertisement message from the HSGW, verify that the AT sends a Router Solicitation message to the HSGW.

n. Ensure that the HSGW sends a Router Advertisement message containing the IPv6 home network prefix.

o. Verify that the AT sends a VSNP: Resv message and includes the PDN-ID to which the QoS application needs to connect. Verify that the AT includes the ProfileID list, TFT, Flow ID, Opcode= 'QoS Check', and a transaction ID in the Resv message.

p. Ensure that the HSGW sends a VSNP: ResvConf message to the AT with OpCode set to 'QoS Check Confirm' and includes the TFT and the authorized R-QoS-Sub-BLOB and the TransactionID that was sent in the Resv message.

q. Ensure that the RAN and AT activate the forward and reverse link flows to which the reservation is mapped.

r. Verify that the AT sends a *ReservationOnRequest* message if the Reservation is not on.

s. Start another application (IPv6 based application) that connects the the same PDN but uses IPv6 addresses.

t. Verify that the AT does not generate a VSNCP Configure Request for the IPv6 based application.

u. Verify that the AT sends a VSNP: Resv message and includes the ProfileID list, TFT, Flow ID, Opcode= 'QoS Check', and the transaction ID that is different than the one used in step o.

v. Ensure that the HSGW sends a VSNP: ResvConf message to the AT with OpCode set to 'QoS Check Confirm' and includes the TFT and the authorized R-QoS-Sub-BLOB and the TransactionID that was sent in the Resv message.

w. Ensure that the RAN and AT activate the forward and reverse link flows to which the reservation is mapped.

x. Verify that the AT sends a *ReservationOnRequest* message if the Reservation is not on.

y. Ensure that the AT can send and receive data for the assigned IPv4 and IPv6 addresses using the PDN-ID used in step i.

#### 2.8.5.4 Minimum Standard

The AT shall comply with steps o, r, t, u, and x.

# 3 End to End Application Tests

## 3.1 SMS origination and termination during active eHRPD session

### 3.1.1 Introduction

Tests in this section verify successful SMS origination and termination during an active eHRPD session.

### 3.1.2 SMS origination during active eHRPD session

#### 3.1.2.1 Definition

This test verifies an SMS message origination from an eHRPD capable AT is successful.

#### 3.1.2.2 Traceability

[2]

Section 3.1 Additional Requirement to support eHRPD operation

[4]

Section 2.4.1.1.1

#### 3.1.2.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.

b. Initiate an eHRPD packet data call from the AT on to RAN2.

c. Keep the data call active by starting a suitable application.

d. Instruct the AT to send an SMS message to RAN1 on the r-csch channel.

e. Verify that the SMS message is correctly received at the SMS Message Center.

f. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session.

g. Instruct the AT to send an SMS message to RAN1 on the r-dsch channel.

h. Verify that the SMS message is correctly received at the SMS Message Center.

i. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session.

#### 3.1.2.4 Minimum Standard

The AT shall comply with steps e, f, h, and i.

RAN1 shall comply with steps e and h.

### 3.1.3 SMS termination during active eHRPD session

#### 3.1.3.1 Definition

This test verifies an SMS message termination from an eHRPD capable AT is successful.

#### 3.1.3.2 Traceability

[2]

Section 3.1 Additional Requirement to support eHRPD operation

[4]

Section 2.4.1.1.1

#### 3.1.3.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.
b. Initiate an eHRPD packet data call from the AT on to RAN2.
c. Keep the data call active by starting a suitable application.
d. Instruct RAN1 to send an SMS message to the AT on the f-csch channel.
e. Verify that the SMS message is correctly received at the AT.
f. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session.
g. Instruct the RAN1 to send an SMS message to the AT on the f-dsch channel.
h. Verify that the SMS message is correctly received at the AT.
i. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session.

#### 3.1.3.4 Minimum Standard

The AT shall comply with steps e, f, h, and i.

## 3.2 SMS origination and termination during dormant eHRPD session

### 3.2.1 Introduction

Tests in this section verify successful SMS origination and termination during a dormant eHRPD session.

### 3.2.2 SMS origination during dormant eHRPD session

#### 3.2.2.1 Definition

This test verifies an SMS message origination from an eHRPD capable AT is successful.

3.2.2.2 Traceability

[2]

Section 3.1 Additional Requirement to support eHRPD operation

[4]

Section 2.4.1.1.1

3.2.2.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.

b. Initiate an eHRPD packet data call from the AT on to RAN2.

c. Wait for the AT connection to go dormant.

d. Instruct the AT to send an SMS message to the RAN1 on the r-csch channel.

e. Verify that the SMS message is correctly received at the SMS Message Center.

f. Verify that the PPP connection is not dropped and the AT is still in dormant state. Note, the dormant state may change as a result of background traffic that causes eHRPD connection to be established.

g. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session compared to the one in step b.

h. Wait for the AT connection to go dormant.

i. Instruct the AT to send an SMS message to the RAN1 on the r-dsch channel.

j. Verify that the SMS message is correctly received at the SMS Message Center.

k. Verify that the PPP connection is not dropped and the AT is still in dormant state. Note, the dormant state may change as a result of background traffic that causes eHRPD connection to be established.

l. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session compared to the one in step b.

3.2.2.4 Minimum Standard

The AT shall comply with steps e, f, j, k, and l.

3.2.3 SMS termination during dormant eHRPD session

3.2.3.1 Definition

This test verifies an SMS message termination from an eHRPD capable AT is successful.

3.2.3.2 Traceability

[2]

Section 3.1 Additional Requirement to support eHRPD operation

[4]

Section 2.4.1.1.1

3.2.3.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.

b. Initiate an eHRPD packet data call from the AT on to RAN2.

c. Wait for the AT connection to go dormant.

d. Instruct RAN1 to send an SMS message to the AT on the f-csch channel.

e. Verify that the SMS message is correctly received at the AT.

f. Verify that the PPP connection is not dropped and the AT is still in dormant state. Note, the dormant state may change as a result of background traffic that causes eHRPD connection to be established.

g. Start an application from the AT and verify traffic channel is correctly set up on RAN2.

h. Wait for the AT connection to go dormant.

i. Instruct RAN1 to send an SMS message to the AT on the f-dsch channel.

j. Verify that the SMS message is correctly received at the AT.

k. Verify that the PPP connection is not dropped and the AT is still in dormant state. Note, the dormant state may change as a result of background traffic that causes eHRPD connection to be established.

l. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session compared to the one in step b.

3.2.3.4 1.3.3 Minimum Standard

The AT shall comply with steps e, f, g, j, k, and l.

## 3.3 Voice call origination and termination during active eHRPD session

3.3.1 Introduction

Tests in this section verify successful Voice call origination and termination during an active eHRPD session.

3.3.2 Voice call origination during active eHRPD session

3.3.2.1 Definition

This test verifies Voice call origination from an eHRPD capable AT is successful.

3.3.2.2 Traceability

[2]

| | |
|---|---|
| Section 3.1: | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 9 | MAC Layer |

3.3.2.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.
b. Initiate an eHRPD packet data call from the AT on to RAN2.
c. Keep the data call active by starting a suitable data application.
d. Initiate a voice call from the AT to RAN1.
e. Verify that the voice call completes and verify CDMA user data in both directions.
f. End the voice call.
g. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session compared to the one in step b.

3.3.2.4 Minimum Standard

The AT shall comply with steps e and g.

The RANs shall comply with steps e and g.

3.3.3 Voice call termination during active eHRPD session

3.3.3.1 Definition

This test verifies Voice call termination from an eHRPD capable AT is successful.

3.3.3.2 Traceability

[2]

| | |
|---|---|
| Section 3.1: | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 9 | MAC Layer |

3.3.3.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.

b. Initiate an eHRPD packet data call from the AT on to RAN2.

c. Keep the data call active by starting a suitable data application.

d. Initiate a voice call from RAN1 to the AT.

e. Verify that the voice call completes and verify CDMA user data in both directions.

f. End the voice call.

g. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session compared to the one in step b.

3.3.3.4 Minimum Standard

The AT shall comply with steps e, and g.

RAN1 shall comply with step e.

RAN2 shall comply with step g.

## 3.4 Voice call origination and termination during dormant eHRPD session

3.4.1 Introduction

Tests in this section verify successful Voice call origination and termination during a dormant eHRPD session.

3.4.2 Voice call origination during dormant eHRPD session

3.4.2.1 Definition

This test verifies a Voice call origination from an eHRPD capable AT is successful.

3.4.2.2 Traceability

[2]

| | |
|---|---|
| Section 3.1: | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 9 | MAC Layer |

3.4.2.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.

b. Initiate an eHRPD packet data call from the AT on to RAN2.

c. Wait for the AT connection to go dormant.

d. Initiate a voice call from the AT to RAN1.

e. Verify that the voice call completes and verify CDMA user data in both directions.

f. End the voice call.

g. Verify that the PPP connection to RAN2 is not dropped and the AT is still in dormant state. Note, the dormant state may change as a result of background traffic that causes eHRPD connection to be established.

h. Resume the application and verify that the AT establishes the connection on RAN2 and does not attempt to negotiate a new PPP session compared to the one in step b.

3.4.2.4 Minimum Standard

The AT shall comply with steps e, g, and h.

RAN1 shall comply with step e.

RAN2 shall comply with steps g and h.

3.4.3 Voice call termination during dormant eHRPD session

3.4.3.1 Definition

This test verifies a Voice call termination from an eHRPD capable AT is successful.

3.4.3.2 Traceability

[2]

| | |
|---|---|
| Section 3.1: | Additional Requirement to support eHRPD operation |

[6]

| | |
|---|---|
| Chapter 7 | Session Layer |
| Chapter 8 | Connection Layer |
| Chapter 9 | MAC Layer |

3.4.3.3 Test Procedure

a. Connect the eHRPD capable hybrid AT as shown in Figure 1 with RAN1 configured as 1xRTT and RAN2 configured as eHRPD.

b. Initiate an eHRPD packet data call from the AT on to RAN2.

c. Wait for the AT connection to go dormant.

d. Initiate a voice call from RAN1 to the AT.

e. Verify that the voice call completes and verify CDMA user data in both directions.

f. End the voice call.

g. Verify that the PPP connection to RAN2 is not dropped and the AT is still in dormant state.

h. Start a data application from the AT and verify traffic channel is correctly set up on RAN2.

#### 3.4.3.4 Minimum Standard

The AT shall comply with steps e, g, and h.

RAN1 shall comply with step e.

RAN2 shall comply with steps g and h.